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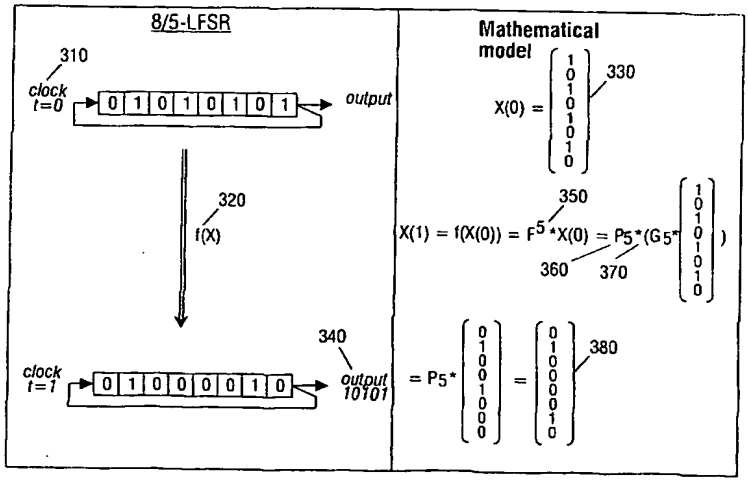
[Continued on next page]

(54) Title: CONFIGURABLE MULTI-STEP LINEAR FEEDBACK SHIFT REGISTER



(57) Abstract: The state transition of a linear feedback shift register (LFSR) controlled by a clock (310) with length N and step size W, W being at least two, is accomplished via a next-state function (320). The next-state function deploys a state transition matrix (350). The state vector (330), which represents the contents of the LFSR, is either multiplied sequentially by the state transition matrix or multiplied by the state transition matrix to the power of W (multiple state transition matrix). The method and the LFSR according to the invention are characterized in that the multiple state transition matrix is decomposed in a first matrix (360) and a second matrix (370), the first matrix comprising at most N + W+ 1 different expressions and the second matrix comprising at most N + W + 1 different expressions. The LFSR further comprises means to multiply the state vector by the second matrix and the first matrix, and means for computing the first matrix. The invention overcomes the shortcomings of configurable multi-step linear feedback shift registers because the amount of time needed to generate the output can be reduced significantly.

WO 2004/090714 A3

EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 412 665 A (PATEL PIYUSHKUMAR C ET AL) 2 May 1995 (1995-05-02) cited in the application	1-4
A	abstract column 3, line 63 - column 4, line 67 figure 2	5-8

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA	Authorized officer
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WANG L-T ET AL INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS: "A HYBRID DESIGN OF MAXIMUM-LENGTH SEQUENCE GENERATORS" PROCEEDINGS OF THE ANNUAL EXPERT SYSTEMS IN GOVERNMENT CONFERENCE. WASHINGTON, 19 - 23 OCTOBER, 1987, WASHINGTON, IEEE COMP. SOC. PRESS, US, vol. CONF. 3, 8 September 1986 (1986-09-08), pages 38-47, XP000746762 abstract page 38, left-hand column, line 16 - right-hand column, line 10 page 40, right-hand column, line 11 - page 41, left-hand column, line 21	1-8

INTERNATIONAL SEARCH REPORT

ɔrmation on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5412665 A	02-05-1995	NONE	